402120 11.1

COYOTE CREEK AT ROCK SPRINGS
SAN JOSE, CA

SENSITIVITY ANALYSIS OF FLOOD DAMAGES FOR THE WITHOUT PROJECT CONDITIONS

PREPARED FOR
THE U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT

BY
WALTER YEP, INC
303 HEGENBERGER ROAD, SUITE 309
OAKLAND, CA 94621

SEPTEMBER 2001

Coyote Creek
Economic Analysis
Update of FDA
September 24, 2001

The following will describe the changes and updates made to the economic analysis on Coyote Creek. These changes were incorporated in the FDA (Flood Damage Analysis) program and account for the increases in Expected Annual Damages (EAD) for the existing without project condition. The three primary changes are: 1) increases in the values of the structures (from values used in the preliminary analysis,) 2) changes in hydraulics (from the SPN provided HEC-RAS files) and 3) additional structures added to the flood plain inventory.

Increase in Structure Value

During our analysis, all structure values were determined as a function of square footage, remaining structure life (100% value - % depreciation) and value per square foot. The original values per square foot were taken from Marshall & Swift's national averages. These averages are too low (conservative) to be used for this study. The San Jose area has much higher construction costs than the national averages. To adjust for the higher construction cost, the M&S local multiplier for San Jose was used to adjust the values. The San Jose local multiplier is 32% higher than the average value. In addition, the type of construction was adjusted from average to good for most structures to represent typical construction of the area. The combined effect was to increase the square footage values to $80 to $95 depending on the type and class of structure.

Change in Hydraulics – New Water Surface Elevations

New HEC-RAS files were provided by SPN and imported in the HEC-FDA program. These new files affect both water surface elevations (WSE's) and the stage-flow relationships (rating curves.) With the new WSE's, depth of flooding increased for many cross-sections and frequencies. With the changes in the rating curve, flooding frequency increased slightly. The net effect is an increase in Expected Annual Damages.

Additional Inventory

Based on the data provided, additional area is now subject to inundation. This new inundation area includes two commercial structures and 64 additional residential units. The residential units are two-story condominium units (square footage per unit listed from 950 to 1200 per unit) with 64 separate garages (200 square feet each) These units are newer and of better construction type than the original 250 units. A value per square foot of about $105 was used for the residential units (and $ 40 per square foot for the garages.) Because we did not know the exact location in the flood plain for these structures, a greater uncertainty in first floor elevation was used. The first floor elevations were set so that water wouldn't first start to enter the structures until after the 1 in 50 chance event. These elevations, and cross sections assigned to the additional structures will need to be verified with aerial mapping if the study is taken further.

The total number of units and the value of damageable property in the revised inventory can be seen in Table 1 below. The number of units in the flood plain has increased from 251 to the current 318. The total value of damageable property has increased to just over $41 million.

Table 1
Total Number of Structures and Values
Subject to Flooding
(October 2000 Prices)

Land Use Type	Number of Structures	Number of Units	Total Revised Structure Value	Total Revised Content Value
Commercial	3	4	$800,000	$800,000
Residential	73	314	$26,400,000	$13,200,000
Total	76	318	$27,200,000	$14,000,000

FDA RESULTS

The changes listed affect both expected annual damages and without project performance. The difference between the preliminary EAD and the revised EAD are shown in Table 2. The revised expected annual damages are estimated at $ 515, 000.

Table 2
Expected Annual Damages

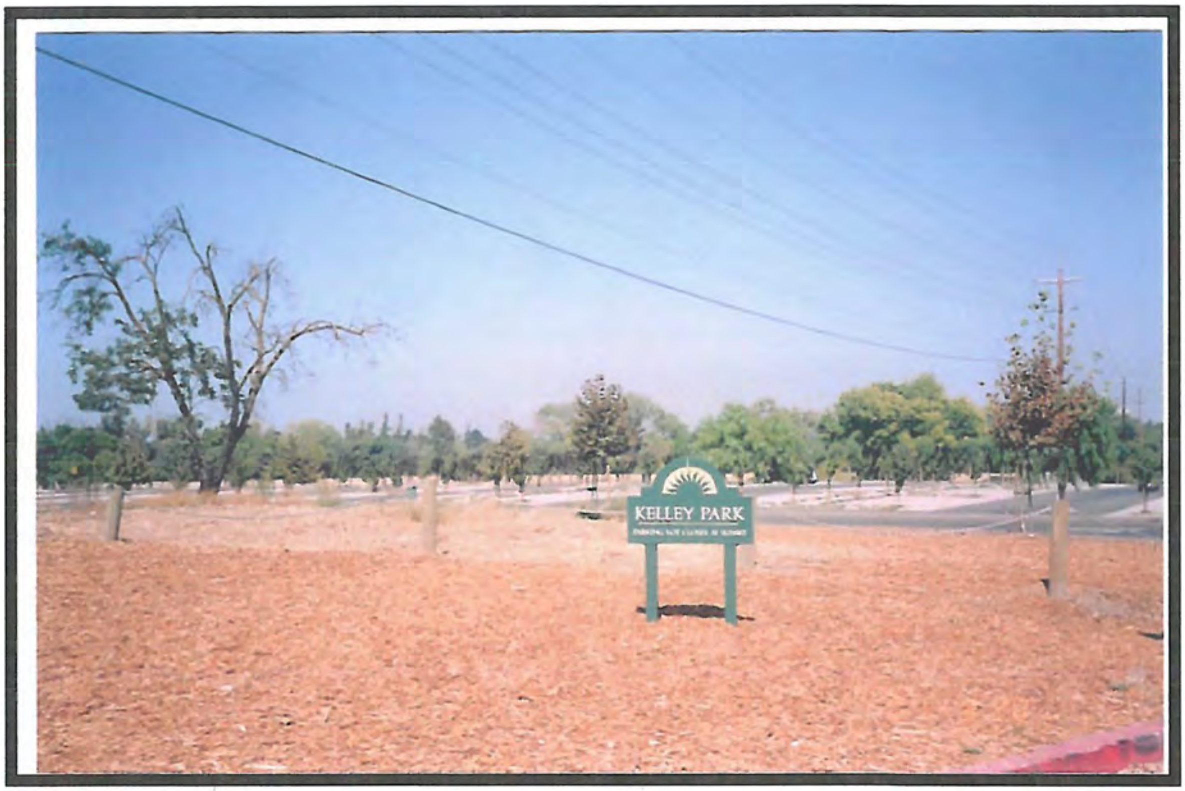
Condition	Residential Damages	Commercial Damages	Automobile Damages	Roads	Emergency Costs	Total Expected Annual Damages
Without Project (Original Inventory, Prices, and Hydraulics)						
Original	**137,000**	**1,000**	**49,000**	**1,000**	**4,000**	**$ 192,000**
Without Project (Revised Inventory, Prices, and Hydraulics)						
Revised	**410,000**	**12,000**	**86,000**	**2,000**	**5,000**	**$515,000**

The changes in project performance are displayed in Table 3. The change in annual exceedance probability represents an increase in the chance of flooding from a 1 in 20 chance in any year to a 1 in 16 chance in any given year.

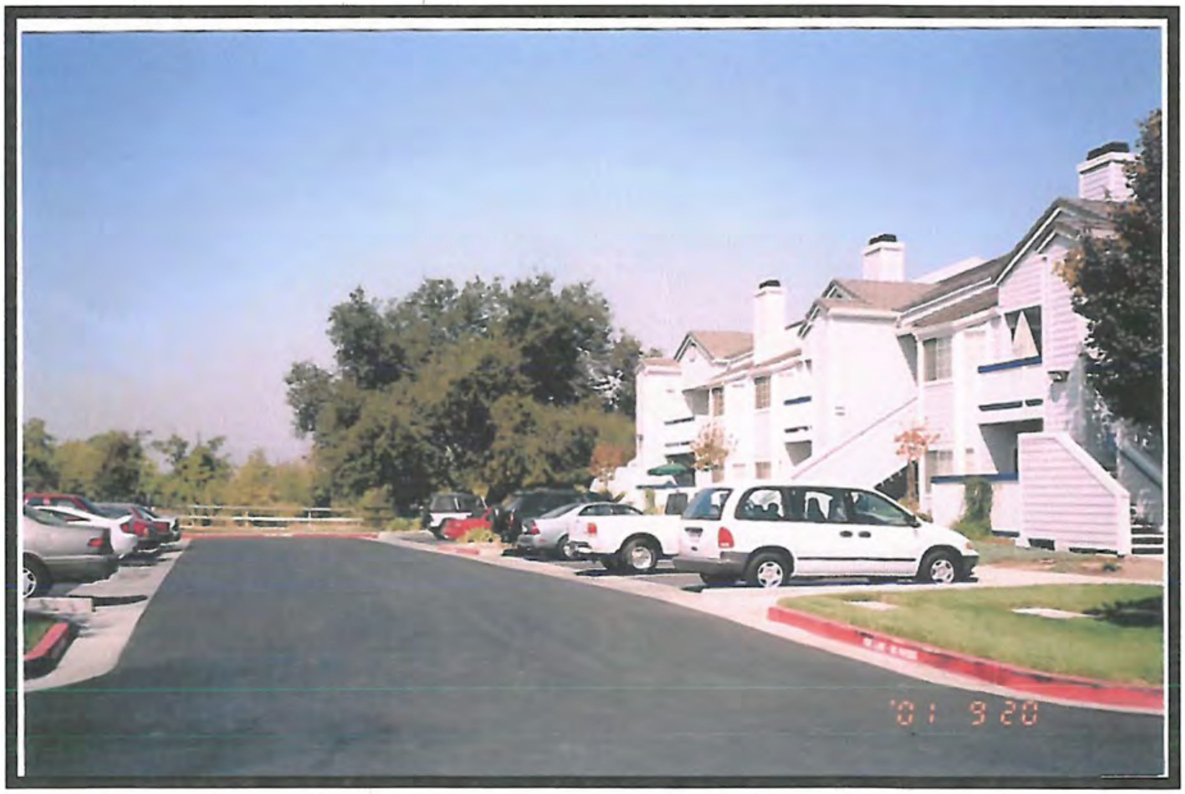
Table 3
Project Performance

Annual Exceedance Probability	Long Term Risk			Conditional Non-Exceedance Probability					
	10 yr	25 yr	50 yr	10%	4%	2%	1%	0.4%	0.2%
Without Project (Original Hydraulics)									
0.049	39%	71%	92%	76%	53%	41%	33%	30%	30%
Without Project (Revised Hydraulics)									
0.061	47%	79%	96%	68%	43%	33%	25%	23%	23%

Photographs of Additional Area Subject to Inundation



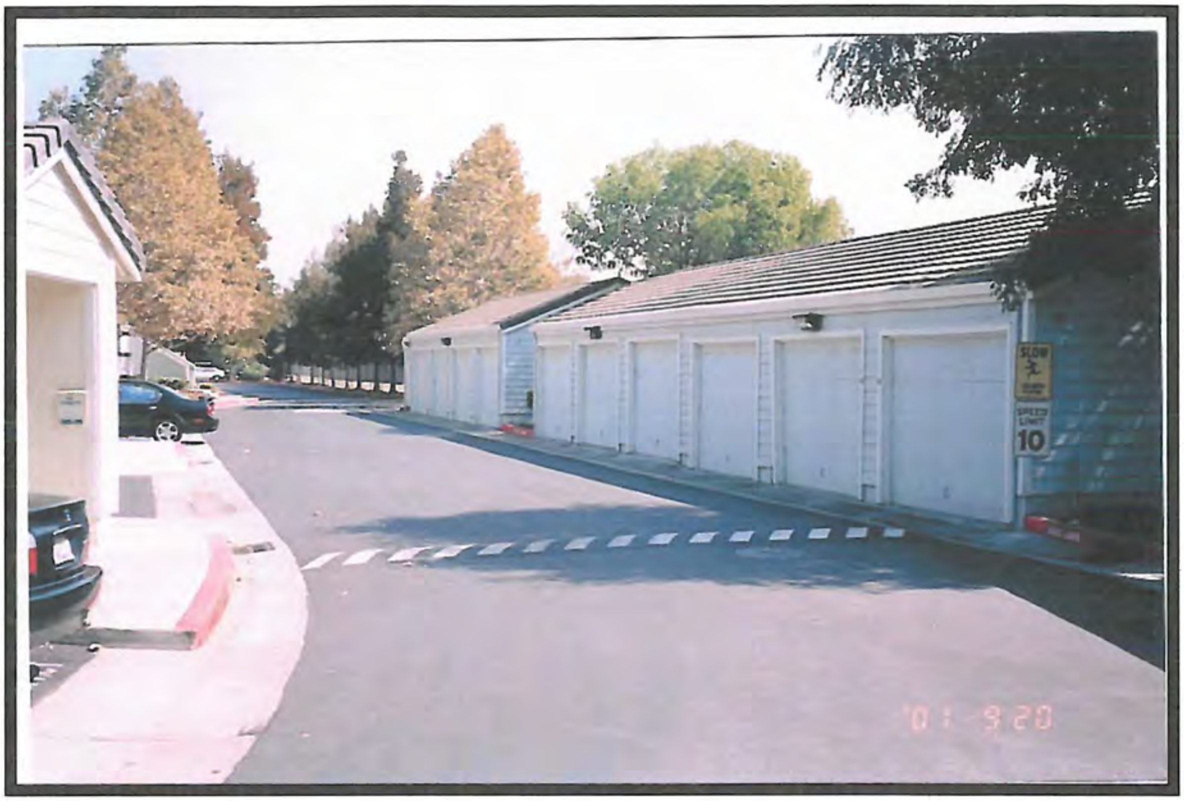
View of Kelley Park parking lot.



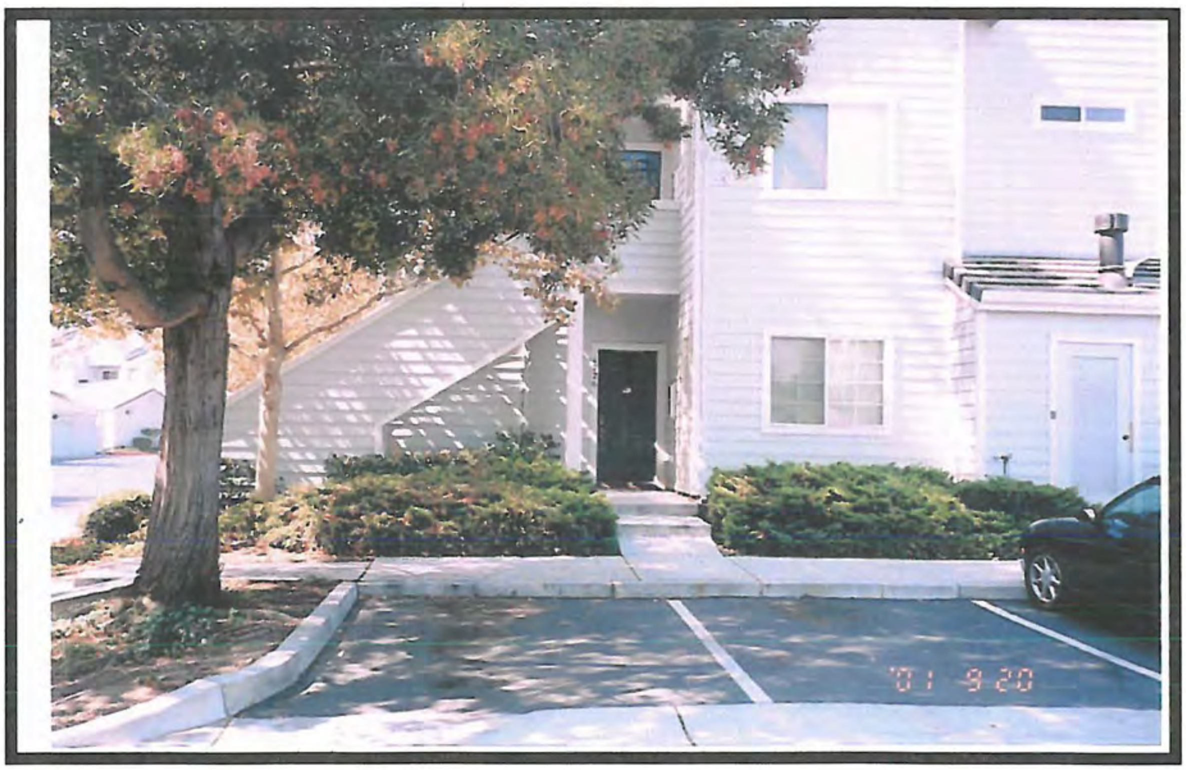
View of housing and outdoor parking on Bevin Brook Dr.

View of entrance of Spring Brook complex.

Wide view of entrance to Bevin Brook Dr.



View of garages on Bevin Brook Dr.



View of entrance to a duplex on Brevin Brook Dr.